

Double trouble: hoarseness and Horner's after supraclavicular brachial plexus block

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Supraclavicular brachial plexus block is a popular procedure for surgeries of the upper limb. Although separate instances of Horner's syndrome and recurrent laryngeal nerve palsies have been previously reported with this approach and one combined incidence has been reported following an interscalene approach, a combined incidence following a supraclavicular approach has not been previously documented. A 21-year-old male patient, who presented with a laceration and suspected vascular injury over his right palm, had a supraclavicular block placed with a tourniquet inflated to minimise bleeding. He developed Horner's syndrome and hoarseness of voice in the immediate postoperative period. There was complete resolution of symptoms after eight hours. The presence of an external force in the form of a tourniquet may influence the spread of the local anaesthetic due to compressive effects on the axillary fascial sheath. However, further studies are required to prove this.

Keywords: combined incidence, Horner's syndrome, recurrent laryngeal nerve palsy, supraclavicular brachial plexus block

Introduction

Supraclavicular block is performed at the level of divisions of the brachial plexus. It has a rapid onset and deep level of block making it desirable for surgeries below the mid-humerus. The incidence of phrenic nerve blockade is lower with this approach when compared with interscalene block. Pneumothorax is an infrequent complication. Recurrent laryngeal nerve and sympathetic chain involvement are known to occur with this block, albeit separately.^{1,2}

We present the case of a patient who developed hoarseness of voice and Horner's syndrome following supraclavicular brachial plexus block.

Case report

Our patient, a 21-year-old male, 157 cm in height, weighing 53 kg, presented with a penetrating injury to his right palm. There were no other injuries, comorbidities or significant past medical history. Since there was profuse bleeding, a vascular injury was suspected and a tourniquet was applied over the proximal part of the upper arm. At the time of examination, his vitals were as follows: Pulse -105 bpm, BP 160/90 mmHg, room air SpO₂ 98%. Airway, spine and systemic examination revealed no abnormalities. His haemoglobin was 14 g%. His last meal was four hours previously. A supraclavicular brachial plexus block was planned. The procedure was explained to the patient and written and informed consent was obtained.

An intravenous line was secured with an 18G cannula on the left-hand dorsum. The patient was positioned supine with his head turned to the left side and a shoulder roll underneath. All aseptic precautions were followed. The lateral insertion of the sternocleidomastoid was palpated. A point 2.5 cm lateral to the sternocleidomastoid was marked. The marked point was confirmed to lie just cephalolateral to the pulsation of the subclavian artery; 2 ml of 2% lignocaine was infiltrated to anaesthetise the skin over the marked point.

A nerve stimulator (Stimuplex DIG RC[®]; B. Braun Medical Inc, Bethlehem, PA, USA) was connected and was set to deliver a current of 1 mA at 1 Hz frequency. A needle (Stimuplex A[®] insulated nerve block needle, 22G, 0.7x 25 mm, 30 degree bevel) was inserted in an anteroposterior direction with a caudal orientation. Response to stimulation was noted at the hand and fingers. After confirming negative aspiration, a mixture of 15 ml 2% lignocaine with adrenaline and 15 ml of 0.5% bupivacaine was administered. The patient's pain score was 0 five minutes post-procedure. There was complete motor block.

The procedure lasted 45 minutes. The tourniquet was kept inflated throughout the procedure. On wound exploration, no major vascular injury was found. Hence debridement and suturing was done. The tourniquet was deflated post-procedure and the patient was shifted to the recovery room.

Upon arrival in the recovery room, the patient complained of hoarseness of voice. On further examination, he was found to have ptosis, miosis and anhidrosis of the right eye. He had no dyspnoea, chest pain or episodes of desaturation. His vitals were stable and systemic examination was unremarkable. The patient was reassured and was admitted overnight for observation.

Periodic examinations were performed and there was complete resolution of symptoms eight hours post-procedure. The rest of the stay was uneventful and the patient was discharged the following morning.

Discussion

Brachial plexus block is widely practised for anaesthesia and analgesia. The complications associated with this procedure are dependent on the level of block. However, the complications are few and infrequent in experienced hands, making it a popular procedure. Although the supraclavicular block is associated with recurrent laryngeal nerve palsy causing hoarseness of voice, and sympathetic chain involvement resulting in Horner's syndrome, it is very rare to find both complications in a single patient.³

In our literature search, we found only one such case report by Seltzer and Joseph, published in 1977, where the patient developed hoarseness and Horner's syndrome after an interscalene brachial plexus block.⁴

The incidence of cervical sympathetic chain block occurring with supraclavicular approach is 20–90% whereas the recurrent laryngeal nerve is affected in 1.3% of patients.⁵ The combined incidence is not known. Both have been attributed to an excessive spread of local anaesthetic. The fascial sheath surrounding the brachial plexus is a determinant of the spread of the local anaesthetic. The sheath is a derivative of deep cervical fascia and terminates by merging with the medial intermuscular septum of the arm. The local anaesthetic injected spreads up and down the nerves in a longitudinal manner and circumferential spread is limited by the fascial sheath.⁶

In the text concerning perivascular techniques of brachial plexus block, Winnie liken the brachial plexus to the epidural space, comparing the axillary approach to a caudal block, subclavian to a lumbar epidural and interscalene to a thoracic epidural, emphasising the continuity of the fascial sheath. The author also mentions that a deformity can be produced in this perivascular compartment by extrinsic pressure, which in turn affects the spread of the local anaesthetic.⁷

In our patient, a tourniquet was inflated at the proximal end of the arm for the purpose of vascular homeostasis which was kept inflated before, during and after the performance of the block, until the end of the procedure. We reason that the tourniquet may have prevented a distal longitudinal spread of local

anaesthetic resulting in an excessive spread proximally to involve the recurrent laryngeal nerve and cervical sympathetic chain. The volume of the drug used might have been an additional contributing factor for the excessive spread.

Conclusion

Further studies are required to determine the spread of local anaesthetics in the presence of a tourniquet. However, we suggest that caution be exercised when local anaesthetic is injected with a tourniquet in place.

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